SECTION 00 01 15
LIST OF DRAWING SHEETS

The drawings listed below accompanying this specification form a part of the contract.

Drawing No.	Title
12-102M Drawing 1 of 2	Repair Roof, B-138 Cover Sheet
12-102M Drawing 2 of 2	Repair Roof, B-138 Roof Detail

- - - END - - -

SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 GENERAL INTENTION

A. Contractor shall completely prepare site for construction operations, including preparation for Demolition, and furnish labor, equipment and materials and perform work for Repair Roof, B-138 as required by drawings and specifications.

B. Visits to the site by Bidders may be made only by appointment with the Medical Center Engineering Officer.

C. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.

D. Prior to commencing work, general contractor shall provide proof that a OSHA certified "competent person" (CP) (29 CFR 1926.20(b)(2) will maintain a presence at the work site whenever the general or subcontractors are present.

E. Training:

1. All employees of general contractor or subcontractors shall have the 10-hour OSHA certified Construction Safety course or other relevant competency training, as determined by VA CP with input from the ICRA team. The Superintendent or certified competent person shall have a 30-hour OSHA certified construction safety course or other relevant competency training as determined by VA CP with input from the ICRA team.

2. Submit training records of all such employees for approval before the start of work.

1.2 STATEMENT OF BID ITEM(S)

A. ITEM I, Includes all work shown on drawing and detail in specifications to replace roof at VA Northern Indiana Health Care Systems, 1700 E. 38th. Street Marion, IN 46953.

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

N/A

1.4 CONSTRUCTION SECURITY REQUIREMENETS

A. Security Plan:

1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.

2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.

B. Security Procedures:

1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.

2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give 3 days notice to the Contracting Officer so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.

3. No photography of VA premises is allowed without written permission of the Contracting Officer or the Project Engineer.

4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

D. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the Project Engineer for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.

E. Document Control:

1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".

2. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.

4. Certain documents, sketches, videos or photographs and drawings may be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who will need it for the project. Return the information to the Contracting Officer upon request.

5. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.

6. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.

7. Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".

8. All electronic information shall be stored in specified location following VA standards and procedures using an Engineering Document Management Software (EDMS).

   a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.

   b. "Sensitive information" including drawings and other documents may be attached to e-mail provided all VA encryption procedures are followed.

F. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before

the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.

2. Separate permits shall be issued for General Contractor and its employees for parking in designated areas only.

1.5 FIRE SAFETY

A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society for Testing and Materials (ASTM):

E84-2008.....Surface Burning Characteristics of Building Materials

2. National Fire Protection Association (NFPA):

10-2006.....Standard for Portable Fire Extinguishers

30-2007.....Flammable and Combustible Liquids Code

51B-2003.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work

70-2007.....National Electrical Code

241-2004.....Standard for Safeguarding Construction, Alteration, and Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

29 CFR 1926.....Safety and Health Regulations for Construction

B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Project Engineer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general contractor’s competent person per OSHA requirements. This briefing shall include information on the

construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Documentation shall be provided to the Project Engineer that individuals have undergone contractor's safety briefing.

C. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.

D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).

E. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Project Engineer.

F. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Project Engineer.

G. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.

H. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

I. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Project Engineer.

J. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.

K. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

L. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.

1.6 OPERATIONS AND STORAGE AREAS

A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

D. Workmen are subject to rules of Medical Center applicable to their conduct.

E. Execute work in such a manner as to interfere as little as possible with work being done by others. Keep roads clear of construction materials, debris, standing construction equipment and vehicles at all times.

F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment,

and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by Project Engineer where required by limited working space.

1. Do not store materials and equipment in other than assigned areas.

2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two work days. Provide unobstructed access to Medical Center areas required to remain in operation.

3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.

G. Utilities Services: Where necessary to cut existing pipes, electrical wires, conduits, cables, etc., of utility services, or of fire protection systems or communications systems (except telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by Project Engineer. All such actions shall be coordinated with the Utility Company involved:

1.7 DISPOSAL AND RETENTION

A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:

1. Reserved items which are to remain property of the Government are noted on drawings or in specifications as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by Project Engineer.

2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.

1.8 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

---END---

SECTION 01 33 23
SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1-1. Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in Section 00 72 00, GENERAL CONDITIONS.

1-2. For the purposes of this contract, samples, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.

1-3. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:

A. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.

1-4. Forward submittals in sufficient time to permit proper consideration and approval action by Government. Time submission to assure adequate lead time for procurement of contract - required items. Delays attributable to untimely and rejected submittals will not serve as a basis for extending contract time for completion.

1-5. Submittals will be reviewed for compliance with contract requirements and action thereon will be taken by project manager on behalf of the Contracting Officer.

1-6. The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional submittals beyond those required by the contract are furnished pursuant to request therefor by Contracting Officer, adjustment in contract price and time will be made in accordance with Articles titled CHANGES (FAR 52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL CONDITIONS.

1-7. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs. Project manager However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.

1-8. Submittals must be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.

A. Submit samples in single units unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and data, and certificates, Five(5)copies each, except where a greater number is specified.

B. Submittals will receive consideration only when covered by a transmittal letter signed by Contractor. Letter shall be sent via first class mail and shall contain the list of items, name of Medical Center, name of Contractor, contract number, applicable specification paragraph numbers, applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as may be required by specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.

1. A copy of letter must be enclosed with items, and any items received without identification letter will be considered "unclaimed goods" and held for a limited time only.
2. Each sample, certificate, manufacturers' literature and data shall be labeled to indicate the name and location of the Medical Center, name of Contractor, manufacturer, brand, contract number and ASTM or Federal Specification Number as applicable and location(s) on project.
3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.

C. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.

D. Approved samples will be kept on file by the Project Engineer at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in

technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.

E. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.

1. For each drawing required, submit one legible photographic paper or vellum reproducible.
2. Reproducible shall be full size.
3. Each drawing shall have marked thereon, proper descriptive title, including Medical Center location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
4. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
5. Submit drawings, ROLLED WITHIN A MAILING TUBE, fully protected for shipment.
6. Two reproducible prints of approved or disapproved shop drawings will be forwarded to Contractor.

1-9. Samples of shop drawings, test reports, certificates and manufacturers' literature and data, shall be submitted for approval to

VA Northern Indiana
Health Care Systems.
1700 E. 38th. ST.
Marion, IN 46953
Attn: Contracting Officer

---END---

SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies the availability and source of references and standards specified in the project manual under paragraphs APPLICABLE PUBLICATIONS and/or shown on the drawings.

1.2 AVAILABILITY OF SPECIFICATIONS LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS FPMR PART 101-29 (FAR 52.211-1) (AUG 1998)

A. The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29 and copies of specifications, standards, and commercial item descriptions cited in the solicitation may be obtained for a fee by submitting a request to – GSA Federal Supply Service, Specifications Section, Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Telephone (202) 619-8925, Facsimile (202) 619-8978.

B. If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (a) of this provision. Additional copies will be issued for a fee.

1.3 AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-4) (JUN 1988)

The specifications and standards cited in this solicitation can be examined at the following location:

DEPARTMENT OF VETERANS AFFAIRS
Office of Construction & Facilities Management
Facilities Quality Service (00CFM1A)
811 Vermont Avenue, NW - Room 462
Washington, DC 20420
Telephone Numbers: (202) 461-8217 or (202) 461-8292
Between 9:00 AM - 3:00 PM

1.4 AVAILABILITY OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-3) (JUN 1988)

The specifications cited in this solicitation may be obtained from the associations or organizations listed below.

AA Aluminum Association Inc.
http://www.aluminum.org

AABC Associated Air Balance Council
http://www.aabchq.com

AAMA American Architectural Manufacturer's Association
http://www.aamanet.org

AAN American Nursery and Landscape Association
http://www.anla.org

AASHTO American Association of State Highway and Transportation Officials
http://www.aashto.org

AATCC American Association of Textile Chemists and Colorists
http://www.aatcc.org

ACGIH American Conference of Governmental Industrial Hygienists
http://www.acgih.org

ACI American Concrete Institute
http://www.aci-int.net

ACPA American Concrete Pipe Association
http://www.concrete-pipe.org

ACPPA American Concrete Pressure Pipe Association
http://www.acppa.org

ADC Air Diffusion Council
http://flexibleduct.org

AGA American Gas Association
http://www.aga.org

AGC Associated General Contractors of America
http://www.agc.org

AGMA	American Gear Manufacturers Association, Inc. http://www.agma.org
AHAM	Association of Home Appliance Manufacturers http://www.aham.org
AISC	American Institute of Steel Construction http://www.aisc.org
AISI	American Iron and Steel Institute http://www.steel.org
AITC	American Institute of Timber Construction http://www.aitc-glulam.org
AMCA	Air Movement and Control Association, Inc. http://www.amca.org
ANLA	American Nursery & Landscape Association http://www.anla.org
ANSI	American National Standards Institute, Inc. http://www.ansi.org
APA	The Engineered Wood Association http://www.apawood.org
ARI	Air-Conditioning and Refrigeration Institute http://www.ari.org
ASAE	American Society of Agricultural Engineers http://www.asae.org
ASCE	American Society of Civil Engineers http://www.asce.org
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers http://www.ashrae.org
ASME	American Society of Mechanical Engineers http://www.asme.org
ASSE	American Society of Sanitary Engineering http://www.asse-plumbing.org

ASTM	American Society for Testing and Materials http://www.astm.org
AWI	Architectural Woodwork Institute http://www.awinet.org
AWS	American Welding Society http://www.aws.org
AWWA	American Water Works Association http://www.awwa.org
BHMA	Builders Hardware Manufacturers Association http://www.buildershardware.com
BIA	Brick Institute of America http://www.bia.org
CAGI	Compressed Air and Gas Institute http://www.cagi.org
CGA	Compressed Gas Association, Inc. http://www.cganet.com
CI	The Chlorine Institute, Inc. http://www.chlorineinstitute.org
CISCA	Ceilings and Interior Systems Construction Association http://www.cisca.org
CISPI	Cast Iron Soil Pipe Institute http://www.cispi.org
CLFMI	Chain Link Fence Manufacturers Institute http://www.chainlinkinfo.org
CPMB	Concrete Plant Manufacturers Bureau http://www.cpmb.org
CRA	California Redwood Association http://www.calredwood.org
CRSI	Concrete Reinforcing Steel Institute http://www.crsi.org

CTI	Cooling Technology Institute http://www.cti.org
DHI	Door and Hardware Institute http://www.dhi.org
EGSA	Electrical Generating Systems Association http://www.egsa.org
EEI	Edison Electric Institute http://www.eei.org
EPA	Environmental Protection Agency http://www.epa.gov
ETL	ETL Testing Laboratories, Inc. http://www.et1.com
FAA	Federal Aviation Administration http://www.faa.gov
FCC	Federal Communications Commission http://www.fcc.gov
FPS	The Forest Products Society http://www.forestprod.org
GANA	Glass Association of North America http://www.cssinfo.com/info/gana.html/
FM	Factory Mutual Insurance http://www.fmglobal.com
GA	Gypsum Association http://www.gypsum.org
GSA	General Services Administration http://www.gsa.gov
HI	Hydraulic Institute http://www.pumps.org
HPVA	Hardwood Plywood & Veneer Association http://www.hpva.org

ICBO	International Conference of Building Officials http://www.icbo.org
ICEA	Insulated Cable Engineers Association Inc. http://www.icea.net
\ICAC	Institute of Clean Air Companies http://www.icac.com
IEEE	Institute of Electrical and Electronics Engineers http://www.ieee.org\
IMSA	International Municipal Signal Association http://www.imsasafety.org
IPCEA	Insulated Power Cable Engineers Association
NBMA	Metal Buildings Manufacturers Association http://www.mbma.com
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry Inc. http://www.mss-hq.com
NAAMM	National Association of Architectural Metal Manufacturers http://www.naamm.org
NAPHCC	Plumbing-Heating-Cooling Contractors Association http://www.phccweb.org.org
NBS	National Bureau of Standards See - NIST
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors http://www.nationboard.org
NEC	National Electric Code See - NFPA National Fire Protection Association
NEMA	National Electrical Manufacturers Association http://www.nema.org
NFPA	National Fire Protection Association http://www.nfpa.org

NHLA National Hardwood Lumber Association
http://www.natlhardwood.org

NIH National Institute of Health
http://www.nih.gov

NIST National Institute of Standards and Technology
http://www.nist.gov

NLMA Northeastern Lumber Manufacturers Association, Inc.
http://www.nelma.org

NPA National Particleboard Association
18928 Premiere Court
Gaithersburg, MD 20879
(301) 670-0604

NSF National Sanitation Foundation
http://www.nsf.org

NWWDA Window and Door Manufacturers Association
http://www.nwwda.org

OSHA Occupational Safety and Health Administration
Department of Labor
http://www.osha.gov

PCA Portland Cement Association
http://www.portcement.org

PCI Precast Prestressed Concrete Institute
http://www.pci.org

PPI The Plastic Pipe Institute
http://www.plasticpipe.org

PEI Porcelain Enamel Institute, Inc.
http://www.porcelainenamel.com

PTI Post-Tensioning Institute
http://www.post-tensioning.org

RFCI The Resilient Floor Covering Institute
http://www.rfci.com

RIS Redwood Inspection Service
See - CRA

RMA Rubber Manufacturers Association, Inc.
http://www.rma.org

SCMA Southern Cypress Manufacturers Association
http://www.cypressinfo.org

SDI Steel Door Institute
http://www.steeldoor.org

IGMA Insulating Glass Manufacturers Alliance
http://www.igmaonline.org

SJI Steel Joist Institute
http://www.steeljoist.org

SMACNA Sheet Metal and Air-Conditioning Contractors
National Association, Inc.
http://www.smacna.org

SSPC The Society for Protective Coatings
http://www.sspc.org

STI Steel Tank Institute
http://www.steeltank.com

SWI Steel Window Institute
http://www.steelwindows.com

TCA Tile Council of America, Inc.
http://www.tileusa.com

TEMA Tubular Exchange Manufacturers Association
http://www.tema.org

TPI Truss Plate Institute, Inc.
583 D'Onofrio Drive; Suite 200
Madison, WI 53719
(608) 833-5900

UBC The Uniform Building Code
See ICBO

UL Underwriters' Laboratories Incorporated
http://www.ul.com

ULC Underwriters' Laboratories of Canada
http://www.ulc.ca

WCLIB West Coast Lumber Inspection Bureau
6980 SW Varns Road, P.O. Box 23145
Portland, OR 97223
(503) 639-0651

WRCLA Western Red Cedar Lumber Association
P.O. Box 120786
New Brighton, MN 55112
(612) 633-4334

WWPA Western Wood Products Association
http://www.wwpa.org

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SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.

B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.

C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:

1. Waste Management Plan development and implementation.
2. Techniques to minimize waste generation.
3. Sorting and separating of waste materials.
4. Salvage of existing materials and items for reuse or resale.
5. Recycling of materials that cannot be reused or sold.

D. At a minimum the following waste categories shall be diverted from landfills:

1. Soil.
2. Inerts (eg, concrete, masonry and asphalt).
3. Clean dimensional wood and palette wood.
4. Green waste (biodegradable landscaping materials).
5. Engineered wood products (plywood, particle board and I-joists, etc).
6. Metal products (eg, steel, wire, beverage containers, etc).
7. Cardboard, paper and packaging.
8. Bitumen roofing materials.
9. Plastics (eg, ABS, PVC).
10. Carpet and/or pad.
11. Gypsum board.
12. Insulation.
13. Paint.

1.2 RELATED WORK

A. Section 01 00 00, GENERAL REQUIREMENTS.

1.3 QUALITY ASSURANCE

A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible. Construction /Demolition waste includes products of the following:
   1. Excess or unusable construction materials.
   2. Packaging used for construction products.
   3. Poor planning and/or layout.
   4. Construction error.
   5. Over ordering.
   6. Weather damage.
   7. Contamination.
   8. Mishandling.
   9. Breakage.

B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.

C. Contractor shall develop and implement procedures to reuse and recycle new materials to a minimum of 50 percent.

D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.

E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website http://www.wbdg.org provides a Construction Waste Management Database that contains information on companies that haul. Collect, and process recyclable debris from construction projects.

F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.

G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.
H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

1.4 TERMINOLOGY

A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.
B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.
C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.
D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.
E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).
F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.
G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.
H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.
I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.
K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.

L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
   1. On-site Recycling – Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
   2. Off-site Recycling – Materials hauled to a location and used in an altered form in the manufacture of new products.

M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.

N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.

O. Return: To give back reusable items or unused products to vendors for credit.

P. Salvage: To remove waste materials from the site for resale or re-use by a third party.

Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.

R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.

S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

1.5 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:

B. Prepare and submit to the Project Engineer a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
   1. Procedures to be used for debris management.
   2. Techniques to be used to minimize waste generation.
   3. Analysis of the estimated job site waste to be generated:

a. List of each material and quantity to be salvaged, reused, recycled.
b. List of each material and quantity proposed to be taken to a landfill.

4. Detailed description of the Means/Methods to be used for material handling.
   a. On site: Material separation, storage, protection where applicable.
   b. Off site: Transportation means and destination. Include list of materials.
      1) Description of materials to be site-separated and self-hauled to designated facilities.
      2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
   c. The names and locations of mixed debris reuse and recycling facilities or sites.
   d. The names and locations of trash disposal landfill facilities or sites.
   e. Documentation that the facilities or sites are approved to receive the materials.

B. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.

C. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

1.6 APPLICABLE PUBLICATIONS

Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.

A. U.S. Green Building Council (USGBC):
LEED Green Building Rating System for New Construction

1.7 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

PART 2 - PRODUCTS

2.1 MATERIALS

A. List of each material and quantity to be salvaged, recycled, reused.

B. List of each material and quantity proposed to be taken to a landfill.

C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

PART 3 - EXECUTION

3.1 COLLECTION

A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.

B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.

C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

3.2 DISPOSAL

A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.

B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

3.3 REPORT

A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.

B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.

C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices. Include the net total costs for each disposal.

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SECTION 07 01 50.19
PREPARATION FOR RE-ROOFING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Roof tear-off, removal of base flashings on existing construction in preparation to receive new roofing membrane.

B. Existing Membrane Roofing System: Asphalt shingles, EPDM, Modified bituminous roofing membrane, etc… with related insulation, surfacing, and components and accessories between deck and roofing membrane.

1.2 RELATED WORK

A. Use of the premises and phasing requirements: Section 01 00 00 GENERAL REQUIREMENTS.

B. Temporary construction and environmental-protection measures for reroofing preparation: Section 01 00 00 GENERAL REQUIREMENTS

1.3 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only. Editions of applicable publications current on date of issue of bidding documents apply unless otherwise indicated.

B. American National Standards Institute/Single-Ply Roofing Institute (ANSI/SPRI):

ANSI/SPRI FX-1-01(R2006) Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners.

C. ASTM International (ASTM):

C208-08.....Cellulosic Fiber Insulating Board

C728-05.....Perlite Thermal Insulation Board

C1177/C1177M-08.....Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing

C1278/C1278M-07.....Standard Specification for Fiber-Reinforced Gypsum Panel

D1079-09.....Standard Terminology Relating to Roofing and Waterproofing

D. FM Approvals: RoofNav Approved Roofing Assemblies and Products.

4450-89.....Approved Standard for Class 1 Insulated Steel Deck Roofs

4470-10.....Approved Standard for Class 1 Roof Coverings

1-28-09.....Loss Prevention Data Sheet: Design Wind Loads.

1-29-09.....Loss Prevention Data Sheet: Above-Deck Roof Components

1-49-09.....Loss Prevention Data Sheet: Perimeter Flashing

E. National Roofing Contractors Association: Roofing and Waterproofing Manual

1.4 MATERIALS OWNERSHIP

A. Assume ownership of demolished materials and remove from Project site and dispose of legally, unless indicated to be reused, reinstalled, or otherwise to remain Owner's property. All removed metals will remain property of the VAMC and shall be disposed of according to the Project Engineer direction.

1.5 DEFINITIONS

A. Refer to ASTM D1079 and NRCA "The NRCA Roofing and Waterproofing Manual" for definition of terms.

1.6 QUALITY CONTROL

A. Requirements of Division 07 roofing section for qualifications of roofing system and roofing insulation Installer; work of this section shall be performed by same Installer.

1. Where Project requirements include removal of asbestos-containing material, Installer must be legally qualified to perform the required work.
2. Where Project requirements include work affecting existing roofing system to remain under warranty, Installer must be approved by warrantor of existing roofing system.

B. Regulatory Requirements: Comply with governing EPA notification regulations. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Reroofing Conference: Conduct conference at Project site.

1. Meet with Owner; Architect-Engineer; testing and inspecting agency representative; roofing system manufacturer's representative; roofing Installer including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing.
2. Review methods and procedures related to roofing system tear-off and replacement

1.7 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:
   1. Recover boards.
C. List of proposed infill materials.
D. List of proposed temporary roofing materials.
E. Fastener pull-out test report.
F. Photographs or Videotape: Document existing conditions of adjacent construction including site improvements.
G. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a licensed landfill facility.

1.8 PROJECT CONDITIONS

A. Owner will occupy portions of building below reroofing area. Conduct reroofing so Owner's operations will not be disrupted.
   1. Coordinate work activities daily with Owner.
   2. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.
B. Protect building and landscaping from damage.
C. Maintain access to existing walkways and adjacent occupied facilities.
D. Weather Limitations: Proceed with reroofing preparation only when weather conditions permit Work to proceed without water entering existing roofing system or building.

1.9 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces affected by reroofing, by methods and with materials acceptable to warrantor.
   1. Notify warrantor of existing roofing system before proceeding, and upon completion of reroofing.
   2. Obtain documentation verifying that existing roofing system has been inspected by warrantor and warranty remains in effect. Submit documentation at Project closeout.

PART 2 - PRODUCTS

2.1 INFILL MATERIALS

A. Use infill materials matching existing membrane roofing system materials.

2.2 TEMPORARY ROOFING MATERIALS

A. Design of temporary roofing and selection of materials are responsibilities of Contractor.

2.3 RECOVER BOARDS

A. Insulation Serving as Recover Board: Requirements are specified in Section 07 22 00 ROOF AND DECK INSULATION.

B. Recover Board: ASTM C208, Type II, Grade 2, cellulosic-fiber insulation board; 13 mm (1/2 inch) thick.

C. Recover Board: Fan-folded, unfaced, extruded-polystyrene board insulation; 10-mm (3/8-inch) nominal thickness.

D. Recover Board: ASTM C1177/C1177M, glass-mat, water-resistant gypsum substrate; Type X, 16 mm (5/8 inch) thick.

E. Recover Board: ASTM C1278/C1278M, cellulosic-fiber-reinforced, water-resistant gypsum substrate; 16 mm (5/8 inch) thick.

F. Recover Board: ASTM C728, perlite board; 25 mm (1 inch) thick.

G. Fasteners: Factory-coated steel fasteners, No. 12 or 14, and metal or plastic plates listed in FM Approval's "RoofNav."

2.4 AUXILIARY REROOFING MATERIALS

A. General: Auxiliary reroofing preparation materials recommended by roofing system manufacturer and compatible with components of existing and new membrane roofing system.

B. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Approval's "RoofNav."

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect existing membrane roofing system that is indicated not to be reroofed.

1. Limit traffic and material storage to areas of existing roofing membrane that have been protected.
2. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.

B. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

1. Comply with Owner's requirements for maintaining fire watch when temporarily disabling smoke detectors.

C. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
   1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new membrane roofing system, provide alternative drainage method to remove water and eliminate ponding.
   2. Do not permit water to enter into or under existing membrane roofing system components that are to remain.

E. Verify that rooftop utilities and service piping have been shut off before beginning the Work.

3.2 ROOF TEAR-OFF

A. General: Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.

B. Remove aggregate ballast from roofing membrane.

C. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing using a power broom.

D. Remove pavers and accessories from roofing membrane. Store and protect pavers and accessories for reuse. Discard cracked pavers.

E. Remove protection mat and insulation from protected roofing membrane.
   1. Discard insulation that is wet and exceeds 128 kg/cu. m (8 lb/cu. ft.).
   2. Store insulation for reuse and protect from physical damage.

F. Roof Tear-Off: Remove existing roofing membrane and other membrane roofing system components down to the deck.
   Remove cover boards, roof insulation, substrate boards.
   1. Dry bitumen and felts that are firmly bonded to concrete decks may remain. Remove wet or unadhered bitumen and felts.
   2. Comply with FM Approvals requirements for removal of excess asphalt from steel decks.
   3. Remove fasteners from deck or cut fasteners off slightly above deck surface and apply recover board prior to installing roof membrane.

G. Partial Roof Tear-Off: Where indicated, remove existing roofing membrane and other membrane roofing system components down to the deck.
   1. Remove cover boards, roof insulation, substrate boards.

2. Dry bitumen and felts that are firmly bonded to concrete decks may remain. Remove wet or unadhered bitumen and felts.
3. Comply with FM Approvals requirements for removal of excess asphalt from steel decks.
4. Remove fasteners from deck or cut fasteners off slightly above deck surface and apply recover board prior to installing roof membrane.

H. Partial Roof Tear-Off: Remove existing roofing membrane and immediately check for presence of moisture by visually observing cover boards, roof insulation and substrate boards that will remain.
1. Coordinate with Owner's inspector to schedule times for tests and inspections immediately after membrane removal.
2. Remove wet or damp boards and roof insulation.
3. Dry bitumen and felts that are firmly bonded to concrete decks may remain. Remove wet or unadhered bitumen and felts.
4. Comply with FMG requirements for removal of excess asphalt from steel decks.
5. Remove fasteners from deck or cut fasteners off slightly above deck surface and apply recover board prior to installing roof membrane.

3.3 DECK PREPARATION

A. Inspect deck after tear-off or partial tear-off of membrane roofing system.

B. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263. Do not proceed with roofing work if moisture condenses under the plastic sheet.

C. If broken or loose fasteners that secure deck panels to one another or to structure are observed or if deck appears or feels inadequately attached, immediately notify Project Engineer. Do not proceed with installation until directed by Project Engineer.

D. If deck surface is not suitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Project Engineer. Do not proceed with installation until directed by Project Engineer.

E. Provide additional deck securement as indicated on Drawings.

F. Replace deck as indicated on Drawings.

3.4 INFILL MATERIALS INSTALLATION

A. Immediately after removal of selected portions of existing membrane roofing system, and inspection and repair, if needed, of deck, fill in

the tear-off areas to match existing membrane roofing system construction.

1. Install new roofing membrane patch over roof infill area. If new roofing membrane is installed the same day tear-off is made, roofing membrane patch is not required.

3.5 TEMPORARY ROOFING MEMBRANE

A. Install approved temporary roofing membrane over area to be reroofed.

B. Remove temporary roofing membrane before installing new roofing membrane.

C. Prepare the temporary roof to receive new roofing membrane according to approved temporary roofing membrane proposal. Restore temporary roofing membrane to watertight condition. Obtain approval for temporary roof substrate from roofing membrane manufacturer and Architect-Engineer before installing new roof.

3.6 ROOF RE-COVER PREPARATION

A. Remove blisters, ridges, buckles, and other substrate irregularities from existing roofing membrane that inhibit new recover boards from conforming to substrate.

B. 1. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing with a power broom.

2. Broom clean existing substrate.

3. Coordinate with Owner's inspector to schedule times for tests and inspections before proceeding with installation of recover boards.

4. Remove materials that are wet or damp. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

B. Remove blisters, ridges, buckles, and other substrate irregularities from existing roofing membrane that inhibit new recover boards, roofing membrane from conforming to substrate.

1. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing with a power broom.

2. Broom clean existing substrate.

3. Coordinate with Owner's inspector to schedule times for tests and inspections.

4. Remove materials that are wet and damp. Removal will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

5. Remove loose aggregate from aggregate-surfaced built-up bituminous roofing with a power broom.
6. Power vacuum the existing roof surface. If recommended by manufacturer, prime dried surface at recommended rate with recommended primer.
7. Provide additional uplift securement for existing roofing system with new screws and plates applied to each roof zone at the following densities:
   a. Field of roof, one fastener for each Sq. Yd.
   b. Corners of roof, one fastener for each Sq. Ft.
   c. Perimeters of roof, one fastener for each Sq. Ft.

3.7 EXISTING BASE FLASHINGS

A. Remove existing base flashings around parapets, curbs, walls, and penetrations.
   1. Clean substrates of contaminants such as asphalt, sheet materials, dirt, and debris.

3.8 FASTENER PULL-OUT TESTING

A. Retain independent testing and inspecting agency to conduct fastener pull-out tests according to SPRI FX-1, and submit test report to Project Engineer before installing new membrane roofing system.
   1. Obtain Project Engineer's approval to proceed with specified fastening pattern. Project Engineer may furnish revised fastening pattern commensurate with pull-out test results.

3.9 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
   1. Storage or sale of demolished items or materials on-site is not permitted.
B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION

SECTION 07 21 13
THERMAL INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section specifies thermal and acoustical insulation for buildings.

B. Acoustical insulation is identified by thickness and words "Acoustical Insulation".

1.2 RELATED WORK

N/A

1.3 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES .

B. Manufacturer's Literature and Data:

1. Insulation, each type used
2. Adhesive, each type used.
3. Tape

C. Certificates: Stating the type, thickness and "R" value (thermal resistance) of the insulation to be installed.

1.4 STORAGE AND HANDLING:

A. Store insulation materials in weathertight enclosure.

B. Protect insulation from damage from handling, weather and construction operations before, during, and after installation.

1.5 APPLICABLE PUBLICATIONS:

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

B. American Society for Testing and Materials (ASTM):

C270-08.....Mortar for Unit Masonry
C516-08.....Vermiculite Loose Fill Thermal Insulation
C549-06.....Perlite Loose Fill Insulation
C552-07.....Cellular Glass Thermal Insulation.
C553-08.....Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
C578-08.....Rigid, Cellular Polystyrene Thermal Insulation
C591-08.....Unfaced Preformed Rigid Cellular Polyisocynurate Thermal Insulation
C612-04.....Mineral Fiber Block and Board Thermal Insulation

C665-06.....Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
C728-05.....Perlite Thermal Insulation Board
C954-07.....Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Base to Steel Studs From 0.033 (0.84 mm) inch to 0.112 inch (2.84 mm) in thickness
C1002-07.....Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
D312-00(R2006).....Asphalt Used in Roofing
E84-08.....Surface Burning Characteristics of Building Materials
F1667-05.....Driven Fasteners: Nails, Spikes and Staples.

PART 2 - PRODUCTS

2.1 INSULATION – GENERAL:

A. Where thermal resistance ("R" value) is specified or shown for insulation, the thickness shown on the drawings is nominal. Use only insulation with actual thickness that is not less than that required to provide the thermal resistance specified.
B. Where more than one type of insulation is specified, the type of insulation for each use is optional, except use only one type of insulation in any particular area.
C. Insulation Products shall comply with following minimum content standards for recovered materials:

Material Type	Percent by Weight
Perlite composite board	23 percent post consumer recovered paper
Polyisocyanurate/polyurethane	
Rigid foam	9 percent recovered material
Foam-in-place	5 percent recovered material
Glass fiber reinforced	6 percent recovered material
Phenolic rigid foam	5 percent recovered material
Rock wool material	75 percent recovered material

The minimum-content standards are based on the weight (not the volume) of the material in the insulating core only.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. Install insulation with the vapor barrier facing the heated side, unless specified otherwise.

B. Install rigid insulating units with joints close and flush, in regular courses and with cross joints broken.

C. Install batt or blanket insulation with tight joints and filling framing void completely. Seal cuts, tears, and unlapped joints with tape.

D. Fit insulation tight against adjoining construction and penetrations, unless specified otherwise.

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SECTION 07 22 00
ROOF AND DECK INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Installation of roof and deck insulation, on new construction ready to receive roofing or waterproof membrane.

B. Repairs and alteration work to existing roof insulation.

1.2 RELATED WORK

A. Perimeter, rigid, and batt or blanket insulation: Section 07 21 13, THERMAL INSULATION.

1.3 QUALITY CONTROL

A. Supervision of work by persons that are knowledgeable and experienced in roofing. See submittals for documentation of supervisors qualification.

B. Unless specified otherwise, comply with the recommendations of the NRCA "Roofing and Waterproofing Manual" applicable to insulation for storage, handling, and application.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Asphalt materials, each type
2. Roofing cement, each type
3. Roof insulation, each type
4. Fastening requirements
5. Insulation span data for flutes of metal decks

C. Samples:

1. Roof insulation, each type
2. Nails and fasteners, each type

D. Certificates:

1. Indicating type, thickness and thermal conductance of insulation. (Average thickness for tapered insulation).
2. Indicating materials and method of application of insulation system on metal decks meet the requirements of Factory Mutual Research Corporation for Class 1 Insulated Steel Deck Roofs.

E. Documentation of supervisors training and experience showing knowledge of roofing procedures.

1.5 DELIVERY, STORAGE AND MARKING

A. Deliver materials to the site in original sealed packages or containers marked with the name and brand, or trademark of the manufacturer or seller.

B. Keep materials dry, and store in dry, weathertight facilities or under canvas tarps. Use of polyethylene or plastic tarps to cover materials is not permitted. Store above ground or deck level on wood pallets. Cover ground under stored materials with plastic tarp.

1. Store rolled materials (felts, base sheets, paper) on end. Do not store materials on top of rolled material.
2. Store foam insulation away from areas where welding is being performed and where contact with open flames is possible.

C. Protect from damage from handling, weather and construction operations before, during, and after installation.

1.6 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. Federal Specifications (Fed. Spec.):

UU-B-790A.....Building Paper, Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire Resistant)

C. American Society for Testing and Materials (ASTM):

C208-08.....Cellulosic Fiber Insulating Board

C209-07.....Test Methods for Cellulosic Fiber Insulating Board

C552-07.....Cellular Glass Thermal Insulation

C726-05.....Mineral Fiber Roof Insulation Board

C728-05.....Perlite Thermal Insulation Board

C1289-08.....Faced Rigid Cellular Polyisocynurate Thermal Insulation Board

D41-05.....Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing

D312-00(R2006).....Asphalt Used in Roofing

D2178-04.....Asphalt Glass Felt Used in Roofing and Waterproofing

D2822-05.....Asphalt Roof Cement

F1667-05.....Driven Fasteners: Nails, Spikes, and Staples

D. Factory Mutual Global (FM):

1-28.....Winds Loads to Roof Systems and Roof Deck Securement

P7825-05.....Approval Guide

E. National Roofing Contractors Association (NRCA):

The NRCA Roofing Manual 2009

F. Underwriters Laboratories, Inc. (UL):

Fire Resistance Directory (2009)

G. U.S. Department of Commerce (NBS):

PS 1-07.....Structural Plywood

H. National Particleboard Association (NPA):

A208.1-93.....Mat-Formed Wood Particleboard

PART 2 - PRODUCTS

2.1 ASPHALT MATERIALS

A. Primer: ASTM D41.

B. Asphalt: ASTM D312, Type III or IV for vapor retarders and insulation.

C. Glass (Felt): ASTM D2178, Type IV, heavy duty ply sheet.

D. Venting Asphalt Base Sheet: ASTM D3672, Type I or Type II.

E. Roof Cement: ASTM D2822, Type I or Type II, asbestos free; or, D4586, Type I or Type II.

2.2 INSULATION

A. Cellular Glass: ASTM C552, Type IV, roof board.

B. Mineral Fiberboard: ASTM C726.

C. Perlite Board: ASTM C728.

D. Isocyanurate Board: ASTM C1289, Type I, Class 2 or Type III.

E. Cellulosic Fiberboard: ASTM C208, Type II, Grade 1 for built-up roofs; Grade 2 for single-ply roofing.

F. Nail base insulating board:

1. Top surface not less than 10 mm (3/8 inch) thick plywood, waferboard or wood particleboard nail base surface.
   a. Plywood: NBS PS 1, Exposure 1.
   b. Particleboard: ANSI A208.1, Type 1 Grade 1-M-2 or Type 2, Grade 2-M-2.
2. Insulation: Isocyanurate or urethane conforming to material specifications.
3. Bottom surface faced with felt facers.

G. Tapered Roof Insulation System Segments:
   1. Fabricate of mineral fiberboard, isocyanurate, perlite board, or cellular glass. Use only one insulation material for tapered sections.
   2. Cut to provide high and low points with crickets and slopes as shown.
   3. Minimum thickness of tapered sections; 13 mm (1/2 inch), unless manufacturers allow taper to zero mm (inch).

2.3 MISCELLANEOUS

A. Building Paper (Sheathing Paper):
   1. Fed. Spec. UU-B-790, Type I, Barrier paper, Grade D, Water - Vapor permeable, Style 1a, Uncreped, not reinforced; or, Style 1b, Uncreped, not reinforced, red rosin sized.
   2. Weighing approximately 3 kg/10 m^2 (six pounds per 100 square feet).

B. Tapered Edge Strips:
   1. Tapered 1:12 (one inch per foot), from 0 mm (0 inches), 300 mm to 450 mm (12 inches to 18 inches) wide.
   2. Cellulosic Fiberboard: ASTM C208.
   3. Mineral Fiberboard: ASTM C726.
   4. Perlite Board: ASTM C728.

2.4 FASTENERS

A. Staples and Nails: ASTM F1667. Type as designated for item anchored and for substrate.

B. Nails for securing base sheets, and first ply of vapor retarder, to wood nailers and deck:
   1. Type I, Style 20, zinc coated steel roofing nails with minimum head diameter of 10 mm (3/8 inch) through metal discs at least 25 mm (one inch) across; or,
   2. One piece nails with an integral flat cap at least 24 mm (15/16 inch) across.

C. Nails for securing building paper and dry felt edge strips to wood nailer and decks:
   1. Type I, Style 20, zinc coated steel roofing nails, 16 mm (5/8 inch) minimum head diameter.
   2. Type IV, staples, Style 3, flat top crown, zinc coated may be used.

D. Nails into plywood: Annular thread type of length to provide at least 19 mm (3/4 inch) penetration.

E. Nails for securing venting base sheet to insulating concrete:

1. Self-clinching type of galvanized steel having an integral flat cap at least 25 mm (one inch) across.
2. Nails shall have a holding power of not less than 27 kg (60 pounds) when pulled from 11.7 kg (25.8 pounds) density insulating concrete.

F. Nails for securing base sheet, building paper, or first ply of vapor retarder to structural wood fiber decks:
1. Self-clinching type having an integral flat cap not less than 25 mm (one inch) across.
2. Nails shall have a holding power of not less than 18 kg (40 pounds) per fastener.

G. Nails for securing insulation venting base sheet to poured gypsum roof deck:
1. Special shaped nail providing diverging or hooking point.
2. Nail shall have flat cap not less than 30 mm (1-1/4 inch) across and shall have a withdrawal resistance of not less than 18 kg (40 pounds) per fastener.

H. Fasteners for securing insulation to steel decks:
1. Conform to requirements of Factory Mutual Research Corporation for wind uplift.
2. Self-drilling galvanized screws with 50 mm (two inch) diameter disk.
3. Antibackout thread design.
4. Have a pullout resistance of 14 kg (30 pounds) minimum.

2.5 RECOVERED MATERIALS

A. Comply with following minimum content standards for recovered materials:

Material Type	Percent by Weight
Perlite composite board	23 percent post consumer recovered paper
Plastic rigid foams: Polyisocyanurate/polyurethane	
Rigid foam	9 percent recovered material
Foam-in-place	5 percent recovered material
Glass fiber reinforced	6 percent recovered material
Rock wool material	75 percent recovered material

B. The minimum-content standards are based on the weight (not the volume) of the material in the insulating core only.

PART 3 - EXECUTION

3.1 GENERAL

A. Do not apply roof insulation if deck will be used for subsequent work platform, storage of materials, or staging or scaffolding will be erected thereon.

B. Entire roof deck construction of any section of the building shall be completed before insulation system work is begun. Curbs, blocking, edge strips, and other components which insulation, roofing and base flashing is attached to shall be in place ready to receive insulation and roofing. Coordinate roof insulation operations with roofing and sheet metal work so that insulation is installed to permit continuous roofing operations.

C. Insulation system materials shall be dry and damage free when applied. Do not use broken insulation or insulation with damaged facings. Remove damaged insulation from the site immediately.

D. Dry out surfaces that become wet from any cause during progress of the work before roofing work is resumed. Apply materials only to dry substrates.

E. Except for temporary protection specified, do not apply materials during damp or rainy weather, during excessive wind conditions, nor while moisture (dew, fog, snow, ice) or frost is present in any amount in or on the materials when temperature is below 10 °C (50 °F). Do not apply materials to substrate having temperature of 10 °C (50 °F) or less.

F. Phased construction is not permitted. The complete installation of all flashing, insulation, and roofing shall be completed in the same day except for the area where temporary protection is required when work is stopped.

G. Temporary Protection for Built-Up Roofing:

1. Install temporary protection consisting of glaze coats and water cutoffs at the end of each day's work and when work is halted for an indefinite period or work is stopped when precipitation is imminent.
2. Glaze coat all exposed surfaces of insulation and felts to seal within the bitumen coating. No insulation or felt surfaces or edges shall be left exposed.
3. Provide water cutoffs at exposed edges of insulation. Cutoffs shall consist of two plies of felt. The first ply extending 150 mm (six inches) beyond edge of roof insulation, the roof deck and the

built-up roofing. The second ply covering the first ply and extending 75 mm (three inches) beyond the first. Install as specified for vapor retarder. When the work resumes, cut the protective felts along the vertical face of insulation and remove, exposing the edges of the insulation.

4. Securely anchor insulation in place to prevent blow off and damage by construction activities.
5. Provide for removal of water or drainage of water away from work.
6. For roof areas that are to remain intact and that are subject to foot traffic and damage, provide wood walkways with notches in sleepers to permit free drainage.

H. Heating Bitumen:

1. Heat the asphalt to the equiviscous temperature plus or minus 14 °C (25 °F), at the time of application.
   a. Asphalt shall not be heated more than 38 °C (100 °F) above the equiviscous temperature.
   b. When the equiviscous temperature is not furnished by the asphalt manufacturer, asphalt shall not be heated above 274 °C (525 °F) for Type III and IV and shall be not less than 246 °C (475 °F) at time of application.
2. At no time shall bitumen be heated above the flash point temperature.
3. Provide heating kettles with a thermometer kept in operating condition. Kettlemen shall be in attendance at all times during heating to insure that the bitumens are heated within the temperatures specified.

I. Use Type III or Type IV asphalt between plies of felt and for installing insulation and vapor retarders.

J. Application of Materials with Hot Bitumen:

1. Apply bitumen in quantities required, immediately followed by materials to be embedded therein, before bitumen cools below the application temperature limit.
   a. Do not apply more material than can be covered at one time, except for glaze coats.
   b. Recoat cooled bitumen areas.

K. Primer: Use four liters (one gallon) of primer per 10 m^2 (100 square feet).

L. Quantities of Asphalt:
   1. Per square unless otherwise specified.
   2. Between insulation layers and deck or vapor retarder: 9 to 14 kg (20 to 30 pounds).
   3. Glaze coats: 7 to 11 kg (15 to 25 pounds).

M. Building Paper (Red rosin):
   1. Lay paper smoothly without buckles or wrinkles at right angles to the roof slope, starting at the low point.
   2. Lap each sheet of paper at least 50 mm (two inches) over preceding sheet, and at ends.
   3. Staple or nail sufficiently to hold in place until the vapor retarder and insulation is installed.

3.2 SURFACE PREPARATION

A. Sweep decks to broom clean condition. Remove all dust, dirt or debris.

B. Remove projections that might damage materials.

C. Concrete Decks, Except Insulating Concrete:
   1. Test concrete decks for moisture prior to application of materials. Heat bitumen as specified and pour approximately 0.5 liters (one pint) of bitumen on surface to which roofing materials are to be applied. If bitumen foams upon contact with the deck or after bitumen has cooled and bitumen is stripped clean from deck leaving no residue, the deck is not dry enough for application of prime coat and subsequent work.
   2. Prime concrete decks, including precast unit, with primer and allow to dry before application of bitumen. Keep primer back 100 mm (four inches) from joints in precast unit.

D. Insulating Concrete:
   1. Allow to dry out for at least five days after installation before the placement of subsequent materials or insulation.
   2. If rain occurs during or at end of drying period or during installation, allow additional drying time before continuing the placement of the subsequent materials or insulation.

E. Poured gypsum shall be dried out in accordance with manufacturer's printed instructions prior to application of subsequent materials.

F. Cover wood sheathing, poured gypsum, gypsum plank, and cement wood fiber plank with a layer of building paper (red rosin).

G. Existing Roofs:

1. At areas to be altered or repaired, remove loose insulation and wet insulation.
2. Cut and remove existing insulation and vapor retarder for new work to be installed. Clean cut edges and install a temporary seal to cut surfaces. Use roof cement and one layer of 7 kg (15 pound) felt strip cut to extend 150 mm (6 inches) on each side of cut surface. Bed strip in roof cement and cover strip with roof cement to completely embed the felt.

3.3 VAPOR RETARDER

A. General:
   1. Install a continuous vapor retarder on roof decks as specified. Install a vapor retarder when phenolic insulation is used.
   2. At vertical surfaces, turn up vapor retarder to top of insulation or base flashing.
   3. At all pipes, walls, and similar penetrations through vapor retarder, seal openings with roof cement to prevent moisture entry from below.
   4. Mop felts solidly in place as specified.
   5. Seal penetrations with roof cement.

B. Cast in Place Concrete Decks, Except Insulating Concrete:
   1. Prime deck as specified.
   2. Apply two plies of asphalt saturated felt mopped down to deck.

C. Precast Concrete Unit Decks Without Concrete Topping:
   1. Prime deck as specified.
   2. Apply two plies of asphalt saturated felt.
   3. Mop to deck, keeping bitumen 100 mm (four inches) away from joints of precast units. Mop between plies as specified.

3.4 SELECTION OF RIGID INSULATION

A. Insulation Type:
   1. Use either cellular glass, mineral fiberboard, perlite board, phenolic board, isocyanurate board, or urethane board or a combination thereof.
   2. Use not less than two layers of insulation unless specified otherwise.
   3. Use either 25 mm (one inch) thick mineral fiberboard, cellular glass, or perlite board as first layer over steel decks. Do not use

phenolic, isocyanurate, or urethane board type insulation directly on steel roof decks.

4. Use either 13 mm (1/2 inch) thick perlite board or mineral fiber board as a top layer over urethane board or isocyanurate board. Composite board is acceptable.
5. Use only cellular glass block for plaza or promenade decks.
6. Where tapered insulation is used, all insulation shall be factory tapered, except perlite board may be field tapered.
7. Use same insulation as existing for roof repair and alterations unless specified otherwise.

B. Insulation Thickness:

1. Thickness of roof insulation shown on drawings is nominal. Actual thickness shall provide the thermal resistance "R" value of not less than 13 for uniform thickness.
2. When thickness of insulation to be used is more or less than that shown on the drawings, make adjustments in the alignment and location of roof drains, flashing, gravel stops, fascias and similar items at no additional cost to the Government.
4. Where tapered insulation is used, the thickness of the insulation at high points and roof edges shall be as shown on the drawings; the thickness at the low point (drains) shall be not less than 38 mm (1-1/2 inches).
5. Use not less than two layers of insulation when insulation is 25 mm (one inch) or more in thickness unless specified otherwise.

3.5 INSTALLATION OF INSULATION

A. Lay insulating units with close joints, in regular courses and with cross joints broken. When laid in more than one layer, break joints of succeeding layers of roof insulation with those in preceding layer. Bed insulation layers in Type III or IV asphalt firmly pressed into the hot bitumen. Keep bitumen below surface of insulation to receive single ply rubber roofing.

B. Lay units with long dimension perpendicular to the rolled (longitudinal) direction of the roofing felt.

C. Cover all insulation installed on the same day by either:

1. The roofing membrane as specified.
2. Temporary protection as specified.

D. Seal all cut edges at penetrations and at edges against blocking with bitumen or roof cement.

E. Cut to fit tight against blocking or penetrations.

F. Over Vapor Retarder, or Concrete Deck: Lay insulation in hot bitumen as specified.

G. Over Precast Concrete Unit Decks: Lay insulation in hot bitumen keeping bitumen back 100 mm (four inches) from joints in precast concrete units.

- - - E N D - - -

SECTION 07 54 00
THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section includes the materials and application procedures for a fully adhered Thermoplastic KEE Fleeceback roofing membrane.

B. Fire rated roof system.

1.2 RELATED WORK

A. Roof Insulation: Section 07 22 00, ROOF AND DECK INSULATION.

C. Roof hatches, equipment supports, dome type skylights, and gravity ventilators: Section 07 72 00, ROOF ACCESORIES.

1.3 QUALITY ASSURANCE

A. Approved applicator by the membrane roofing system manufacturer, and certified by the manufacturer as having the necessary expertise to install the specific system.

B. Pre-Roofing Meeting:

1. Upon completion of roof deck installation and prior to any roofing application, hold a pre-roofing meeting arranged by the Contractor and attended by the Roofing Inspector, Material Manufacturers Technical Representative, Roofing Applicator, Contractor, and COTR,
2. Discuss specific expectations and responsibilities, construction procedures, specification requirements, application, environmental conditions, job and surface readiness, material storage, and protection.
3. Inspect roof deck at this time to:
    a. Verify that work of other trades which penetrates roof deck is completed.
    b. Determine adequacy of deck anchorage, presence of foreign material, moisture and unlevel surfaces, or other conditions that would prevent application of roofing system from commencing or cause a roof failure.
    c. Examine samples and installation instructions of manufacturer.
    d. Perform pull out test of fasteners.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Applicators approval certification by manufacturer.

C. Shop Drawings:

1. Sheet membrane layout.
2. Fastener pattern, layout, and spacing requirements.
3. Termination details.

D. Manufacturers installation instructions revised for project.

E. Samples:

1. Sheet membrane: One 150 mm (6 inch) square piece.
2. Sheet flashing: One 150 mm (6 inch) square piece.
3. Fasteners: Two, each type.
4. Welded seam: Two 300 mm (12 inch) square samples of welded seams to represent quality of field welded seams.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle materials as specified by manufacturer.

B. Store volatile materials separate from other materials with separation to prevent fire from damaging the work, or other materials.

1.6 PERFORMANCE REQUIREMENTS

A. General:

1. Install a watertight, fully adhered single ply Thermoplastic KEE Fleeceback roofing system with compatible components that will not permit the passage of liquid water and will withstand wind loads, thermally induced movement, and exposure to weather.

1.7 WARRANTY

A. Roofing work subject to the terms of the Article “Warranty of Construction”, FAR clause 52.246-21, except extend the warranty period to fifteen years.

B. Warranty includes coverage of:

1. Roofing membrane, base flashings, insulation boards, cover boards, membrane fasteners and plates, membrane and flashing adhesives, insulation adhesives, wood nailers, curbs and cants, all perimeter metal edges, copings, and counterflashings (even those reused), all roof drains, drain bowls, drain rings, any salvaged and reused components, etc.
2. Any roof leak or other problems caused by substrate movement of any component other than the deck shall not be excluded
3. Damages caused by wind speed up to 74 miles per hour.
4. All components including those manufactured by others and reused.

1.8 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

A167-99 (R2004).....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

B209-07.....Aluminum and Aluminum-Alloy Sheet and Plate

D751-06 .....Coated Fabrics

D4586-07 .....Asphalt Roof Cement, Asbestos Free

E96-05.....Water Vapor Transmission of Materials

E108-07.....Fire Tests of Roof Coverings

C. National Roofing Contractors Association (NRCA):

Fifth Edition - 05.....The NRCA Roofing and Waterproofing Manual.

D. Federal Specifications (Fed. Spec.)

FF-S-107C(2).....Screws, Tapping and Drive

FF-S-111D(1).....Screw, Wood

UU-B-790A.....Building Paper, Vegetable Fiber (Kraft, Waterproofed, Water Repellent and Fire Resistant)

E. Factory Mutual Engineering and Research Corporation (FM):

Annual Issue.....Approval Guide Building Materials

F. Underwriters Laboratories, Inc (UL):

Annual Issue.....Building Materials Directory

Annual Issue.....Fire Resistance Directory

G. Warnock Hersey (WH):

Annual Issue.....Certification Listings

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed. Thermoplastic KEE Fleeceback Membrane Roof System shall not be installed during periods of precipitation.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC ROOF MEMBRANE MATERIALS

A. Thermoplastic KEE Fleeceback Membrane Roof Materials
   1. Elastomeric Sheeting
      a. Elastomeric sheeting comprised of a fleeceback elastomeric tri-polymer alloy based on Elvaloy, blended with CPE and PVC and reinforced with a high strength, wick resistant polyester fabric.
      b. Exceeds the performance requirement of ASTM D 4434-04, type IV.
      c. Surface Color: White
      d. Thickness: 60 mil
   2. Membrane Adhesive
      a. Fully adhered fleece-back membrane adhesive as required by membrane manufacturer to be Manufacturer warrantable.

2.2 FLASHING MATERIALS

A. Base Flashing Sheets:
   1. Elastomeric sheeting
      a. Thickness: 60 mil.
      b. Surface Color: White

2. Base Flashing Adhesive:
    a. Manufacturer's Warrantable Adhesive.

B. Flashing Accessories:
1. Membrane Coated Metal Flashing:
    a. Manufacturer's warrantable flashing.
2. Cover Strip:
    a. Manufacturer's warrantable cover strip.
3. Flashing Membrane:
    a. Manufacturer's warrantable flashing membrane.
4. Vent Pipe Boots:
    a. Manufacturer's warrantable vent pipe boots.
        (i.) Pipe Size:

(a)	Small	1 inch to 4 inches
(b)	Large	4 inches to 8 inches

    b. Field Fabricated Boots
        (ii.) Manufacturer's warrantable boots.
5. Corners:
    a. Manufacturer's warrantable corners.
6. Drain Sealant:
    a. Manufacturer's warrantable sealant.

2.3 ACCESSORY MATERIALS

A. Metal cleaner:
1. Mineral spirits

B. Termination bar:
1. Aluminum, with caulk receiver:
    a. 1/4 by 1 inch
2. Caulking:
    a. Manufacturer's warrantable urethane sealant.

C. Temporary Tie-in Materials.

1. Three ply application of compatible products.

D. Pitch Pan Fill:
   1. Base fill:
      a. ASTM C928-92a, rapid hardening non-shrink grout.
   2. Top fill:
      b. Manufacturer's warrantable pourable Sealer

PART 3 - EXECUTION

3.1 GENERAL

A. Do not apply if deck will be used for subsequent work platform, storage of materials, or staging or scaffolding will be erected thereon unless protection provided to distribute loads less than one-half compression resistance of roofing system materials.
   1. Curbs, blocking, edge strips, and other components to which roofing and base flashing is attached in place ready to receive insulation and, roofing.
   2. Coordinate roof operation with sheet metal work and roof insulation work so that insulation and flashing are installed concurrently to permit continuous roofing operations.
   3. Complete installation of flashing, insulation, and roofing in the same day except for the area where temporary protection is required when work is stopped.

B. Phased construction is not permitted. The complete installation of roofing system is required in the same day except for area where temporary protection is required when work is stopped.

C. Dry out surfaces that become wet from any cause during progress of the work before roofing work is resumed.

D. Apply materials only to dry substrates.

E. Except for temporary protection specified, do not apply materials during damp or rainy weather, during excessive wind conditions, nor while moisture (dew, snow, fog, ice, or frost) is present in any amount in or on the materials.

1. Do not apply materials to substrate having temperature of 4°C (40 degrees F) or less, or when materials applied with the roof require higher application temperature.
2. Do not apply materials when the temperature is below 4°C (40 degrees F).

3.2 PREPARATION

A. Clean substrate of dust, debris, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install Thermoplastic KEE Fleeceback roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Thermoplastic Roofing".

B. Install roofing system per manufacturer's published specifications manual.

C. Coordinate installation of roofing system components so insulation and roofing plies are not exposed to precipitation or remain exposed at the end of the workday or when rain is forecast.

D. Provide water cutoffs at end of each day's work to cover exposed ply sheets and insulation. Water tightness of the water cutoffs is the contractor's responsibility.

E. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

F. Remove and discard temporary seals before beginning work on adjoining roofing.

G. Substrate-Joint Penetrations: Prevent adhesive from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

H. It is the building owner's responsibility or that of its architect, engineer, or contractor to determine if the Building Code criteria are met for the particular geographic area where the building is located or the particular construction of the building.

3.4 INSULATION INSTALLATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installing roofing insulation.

3.5 HOT AIR WELDING EQUIPMENT

A. Seams can only be made by the hot-air welding process. When the membrane is properly fused, the hot-air heat welding process produces seams that are as strong as the membrane itself. The following information is presented as a guide to assist contractors in utilizing hot-air heat welding equipment. Prior to actual selection and operation of the hot-air heat welding equipment, refer to the manufacturer's operating instructions. The operation of hot-air heat welding equipment, and the results obtained utilizing this equipment, are the responsibility of the roofing contractor.
   1. Leister Variant Automatic Welder

a. Power Requirements: 220 volts, 30 amp, 7500 watts single phase.
b. Power cord and plugs: #10 wire with 3-prong twist plug. #10 wire may be used up to 150' in length. For longer lengths, consult an electrician for line voltage drop.
c. Element: 4500 Watts
d. Adjustment Tools: Adjustable wrench, various metric box wrenched, various metric allen wrenches, screwdrivers, 40mm nozzle only.
e. Additional Weight: A 45lb. Supplemental weight is required for the automatic welder. It shall rest on the aluminum housing over the rear wheels when the welder is being used.

2. Leister "Triac" Hand Welder
   a. Power requirements: 115 volts, 15 amps, and 1800 watts single phase.
   b. Power cord #12. Check with electrician for line voltage drop for length over 200'.
   c. Element: 1600 Watt
   d. Accessories: 40mm nozzle, various silicone and metal rollers.
3. Power Generators
   a. If a power generator is used only for the automatic welder a minimum of 220 volts, 30 amps, 7500-watt unit is required.

3.6 FULLY ADHERED ROOF MEMBRANE INSTALLATION

A. Install membrane according to roofing system manufacturers written instructions, starting at low point of roofing system. Place ply sheets to ensure water will flow over or parallel to, but never against exposed edges. Shingle in direction to shed water.
   1. Thermoplastic KEE Fleeceback membrane shall be fully adhered to properly installed and prepared substrate surface. The surface shall be clean, dry, smooth, and free from contamination.
   2. The roof perimeters and corners may require additional design to develop the necessary resistance for wind conditions in excess of gale force winds. Contact manufacturer for additional information if the building is located

where winds may exceed standard warranty conditions or special code provisions are required.

3. The membrane shall be cut to fit neatly around all penetrations and roof projections.
4. The roofing membrane shall be unrolled and positioned with a minimum 3-inch overlap. Laps shall be shingled with, or run parallel to, the slope of the roof.

B. Adhesive Attachment:
   1. Apply adhesive full coverage per manufacturer's guidelines.

C. Perimeter/Projection Attachment:
   1. Provide attachment of roofing membrane at roof perimeter, walls, expansion joints, and all other projections. Follow the recommendations of Factory Mutual Loss Prevention Data Sheets 1-28, 1-29, and 1- 49.
   2. Perimeter attachment and metal must conform to ANSI SPRI ES-1.

D. Membrane Seaming:
   1. All surfaces shall be clean and dry.
   2. Allow hot air welder to warm up. Insert the nozzle tip of the hot air welder into seam area. Move nozzle at a steady speed along the seam area, immediately applying pressure behind the air nozzle with a Neoprene roller or weighted wheel to ensure positive contact of the heated roof membrane lap. Minimum width of welded lap per manufacturer's guidelines. Hand welds shall be per manufacturer's guidelines.

E. Field test heat welded laps to assure proper construction. Perform field test after lap area cools to ambient temperature. Properly constructed laps will not separate at the lap interface when tested.

   Membrane Laps:
   1. Do not apply adhesive over membrane in ply lap areas. Seal end lap with 6-inch strip of membrane. Heat-weld strip over end lap. Stagger end laps.
   2. Heat-weld side laps where applicable.

3.7 GENERAL FLASHING REQUIREMENTS AND STRIPPING INSTALLATION

A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.

B. All flashings shall be installed as shown on the detail drawings. All membrane flashings shall be installed concurrently with the roof membrane as the project progresses. No temporary flashings shall be allowed without prior written approval of the authorized agent. If any water is allowed to enter under the new roofing due to incomplete flashings, the affected area shall be removed and replaced at subcontractor’s expense.

C. Clean seam areas, overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

D. Flashings shall not be applied over existing thru-wall flashings or weep holes. All flashings shall extend a minimum of 8-inches above roof level. All existing flashings shall be removed before applying a new flashing.

E. Flash all pipes with Pre-fabricated Flashing Boots where possible. Field fabricate pipe flashings with Flashing Membrane (unreinforced flashing) per standard Roofing Systems details when a pre-molded flashing is not feasible.

F. Fabricate all metal flanged flashings per manufacturer’s guidelines.

G. Membrane base flashings shall consist of fully adhered thermoplastic KEE sheet membrane.
   1. The base flashing membrane shall be fully adhered to a dry, smooth solvent-resistant and compatible substrate using approved adhesive. The perimeter sheet base flashing membrane may be fully adhered.

2. Over the properly installed and prepared substrate, approved adhesive shall be applied to both surfaces using approved solvent resistant rollers. The adhesive shall be applied in a smooth even coat with no puddles, or voids. The adhesive coating shall be allowed to become tacky, before installing the flashing membrane.
3. Drying time of adhesive increases with presence of humidity or cooler temperatures.
4. When the Thermoplastic KEE membrane has been cut to correct width and length, embed the flashing into the substrate adhesive, taking care to avoid wrinkles.
5. Care should be taken to ensure that the flashing does not bridge where there is a change of direction.
6. The top of the installed flashing shall be fastened under metal counterflashing, coping cap, or through wall metal reglet. The maximum distance between fasteners for flashings shall be 8 inches through flat bar or 12 inches through metal reglet.
7. Install prefabricated universal corners for sealing all inside and outside corners.

3.8 DAILY WATERSTOP/TIE-INS

A. Install tie–in.
   1. Remove embedded gravel/debris from top ply of felt along termination.
      a. Width: 24 inches
   2. Remove dirt and debris from tie-in area.
      a. Width: 24 inches
   3. Adhere 12 and 18-inch wide ply sheets from exposed deck to existing roofing with a continuous 1/16 thick application of tie-off mastic. Glaze cut-off with surfacing mastic. Extend 18 inch wide felt 3 inches either side 12-inch felt.
   4. Install “deadman” insulation filler at insulation staggers.

5. Extend new roofing membrane at least 24 inches onto prepared area of adjacent existing roofing. Seal edge with 6 inches wide reinforcing membrane embedded between alternate courses of tie-off mastic.
6. Remove temporary connection at beginning of next workday by cutting membrane evenly along edge of existing roof system. Remove" deadman" insulation fillers.

3.9 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

3.10 PROTECTING AND CLEANING

A. Protect roofing membrane from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to WTI personnel.

B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair base flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.

C. Clean over spray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

D. Contractor shall be responsible for vehicles and other property that is contaminated by cold adhesive over spray or drippage.

END OF SECTION 075400

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies copings, gravel stops, fascias, and expansion joints.

1.2 RELATED WORK

A. General insulation: Section 07 21 13, THERMAL INSULATION

B. Rigid insulations for roofing: Section 07 22 00, ROOF AND DECK INSULATION

1.3 QUALITY CONTROL

A. All roof accessories shall be the products of manufacturers regularly engaged in producing the kinds of products specified.

B. Each accessory type shall be the same and be made by the same manufacturer.

C. Each accessory shall be completely assembled to the greatest extent possible before delivery to the site.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Samples: Representative sample panel of color anodized aluminum not less than 100 mm X 100 mm (four by four inches), except extrusions shall be a width not less than section to be used. Sample shall show coating with integral color and texture and shall include manufacturer's identifying label.

C. Shop Drawings: Each item specified showing design, details of construction, installation and fastenings.

D. Manufacturer's Literature and Data: Each item specified.

E. Certificates: Stating that aluminum has been given specified thickness of anodizing.

1.5 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extend referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing and Material (ASTM):

B209/209M-07.....Aluminum and Aluminum Alloy-Sheet and Plate

B221/221M-07.....Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

C612-04.....Mineral Fiber Block and Board Thermal Insulation

D1187-97 (R2002).....Asphalt-Base Emulsions for Use as Protective Coatings for Metal

C. National Association of Architectural Metal Manufacturers (NAAMM):
AMP 500-505-88.....Metal Finishes Manual

D. American Architectural Manufacturers Association (AAMA):
605-98.....High Performance Organic Coatings on Architectural Extrusions and Panels.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum, Extruded: ASTM B221/B221M.

B. Aluminum Sheet: ASTM B209/B209M.

C. Galvanized Sheet Steel: ASTM A526/A526M; G-90 coating.

D. Insulation: ASTM C612, Class 1 or 2.

~~E~~. Asphalt Coating: ASTM D 1187, Type I, quick setting.

2.2 COPINGS

A. Fabricate of aluminum not less than 0.125 inch thick, or 0.5 mm (0.018 inch thick stainless steel

B. Turn outer edges down each face of wall as shown.

C. Maximum lengths of 3000 mm (10 feet).

D. Shop fabricate external and internal corners as one piece assemblies with not less than 300 mm (12 inch) leg lengths.

E. Provide 100 mm (four inch) wide 0.8 mm (0.032 inch) thick watertight joint covers.

F. Provide anchor gutter bar of 0.8 mm (0.032 inch) thick with anchor holes formed for underside of joint.

G. Provide concealed guttered splice plate of 0.8 mm (0.032 inch) thick with butyl or other resilient seal strips anchored to splice plate for underside of joint. Use galvanized steel anchor plate providing compression spring anchoring of coping cover.

I. Finish: Anodized as specified.

2.3 EXTRUDED ALUMINUM GRAVEL STOPS AND FASCIAS

A. Fabricate of aluminum not less than 2 mm (0.078 inch) thick.

B. Turn fascia down face of wall and up above roof as shown.

C. Maximum lengths of 3000 mm (10-feet).

D. Shop fabricate external and internal corners as one piece assemblies with not less than 300 mm (12 inch) leg lengths.

E. Provide 100 mm (four inch) wide 2 mm (0.078 inch) thick watertight joint covers with 150 mm (six inch) wide 0.8 mm (0.030 inch) thick underside joint flashing.

2.4 EXTRUDED ALUMINUM FASCIA-CANT SYSTEM

A. The fascia-cant system consists of three pieces, an extruded aluminum fascia, a galvanized steel cant, and an aluminum compression clamp.
B. Furnish in stock lengths of not more than 3000 mm (10 feet) long.
C. Form fascia from not less than 2 mm (0.070 inch) thick aluminum. Provide four inch wide 0.8 mm (0.032-inch) thick concealed sheet aluminum joint cover plates in back of fascia.
D. Form cant strip from galvanized steel not less than 0.8 mm (0.0299 inch) thick, to profile shown and design to hold lower edge of the fascia.
E. Form compression clamp of not less than 0.8 mm (0.032 inch) thick aluminum designed to hold the top edge of the fascia and the built-up flashing.
F. Internal and external corners:
   1. Factory fabricate and fully weld mitered joints.
   2. Furnish corner sections in manufacturers standard sizes with not less than 300 mm (12 inch) leg lengths.
G. Finish on aluminum: anodized fluorocarbon as specified.

2.5 EXTRUDED ALUMINUM ROOF EXPANSION JOINT COVERS

A. Fabricate in 3000 mm (10 foot) lengths with fastener openings slotting for expansion not over 600 mm (24 inch) centers.
B. Provide four-way expansion, for joint widths shown.
C. Mill finish on aluminum.
D. Form waterstop or moisture seals of continuous sheets of neoprene, not less than 0.8 mm (0.032 inch) thick.
E. Fabricate corners as one piece assembly with mitered and welded joint and least dimension legs not less than 300 mm (12 inches) long.
F. Factory fabricate end caps and transitions to insure waterproof assembly.
G. Three piece assembly:
   1. Roof expansion joint cover system consists of an extruded aluminum cover, extruded frame or curb vertical section, galvanized steel cant, and aluminum compression clamp counter flashing, complete with moisture seals. Form cover and vertical section from extruded aluminum, 2 mm (0.080 inch) minimum thickness with spring stainless steel tension or pivot bar.

2. Form cant from galvanized steel not less than 0.8 (0.029 inch) thick formed to profile shown.
3. Form splice plates of not less than 0.8 mm (0.032 inch) thick aluminum sheet.
4. Form counter flashing member of 1.3 mm (0.050 inch) thick sheet aluminum, secured with screws to the top edge of the vertical section and providing compression clamp over base flashing.
5. Provide compression gasket separating cover from curb bearing.

H. Two piece assembly:
1. Roof expansion joint system consists of an extruded aluminum cover combination extruded aluminum frame or curb with integral adjustable counter flashing flange, and moisture seals.
2. Form cover from extruded aluminum 2 mm (0.078 inch) minimum thickness.
3. Form cover anchor system of stainless steel pivot bar.
4. Form frame assembly of not less than 2 mm (0.076 inch) aluminum except for flashing portion.
5. Provide compression gasket separating cover from curb at bearing.

2.6 FINISH

A. In accordance with NAAMM Amp 500-505.
B. Aluminum, Mill Finish: AA-MIX, as fabricated.
C. Aluminum, Clear Finish: AA-C22A41 medium matte, clear anodic coating, Class 1, Architectural, 0.7 mils thick.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install roof accessories where shown.
B. Secure with fasteners in accordance with manufacture's printed installation instructions and approved shop drawings unless shown otherwise.
C. Coordinate to install insulation where shown; see Section 07 21 13, THERMAL INSULATION and Section 07 22 00, ROOF AND DECK INSULATION.
D. Coordinate with roofing work for installation of items in sequence to prevent water infiltration.
E. Gravel Stops and Fascias:
1. Install gravel stops and fascia with butt joints with approximately 6 mm (1/4 inch) space for expansion.
2. Over each joint provide cover plates of sheet aluminum, complete with concealed sheet aluminum flashing, centered under each joint.

3. Lap cover plates and concealed flashing over the gravel stop and fascia not less than four inches.
4. Extend concealed flashing over built-up roofing, embed in roof cement and turn down over face of blocking at roof edge.

F. Aluminum Coping:
1. Install sections of coping with approximately 6 mm (1/4-inch) space between ends of sections.
2. Center joint gutter bar and covers at joints and securely lock in place.
3. When snap-on system is used insure front and back edges are locked in place.

G. Fascia-Cant System:
1. Install galvanized steel cant; coordinate with roofing work and after completion of roofing work install extruded aluminum fascia, concealed joint cover plate, and aluminum compression clamp, where shown.
2. Install system to allow for expansion and contraction with 6 mm (1/4 inch) space between extruded aluminum members and galvanized steel cant as required by manufacturer of system.
3. Offset joints in extruded aluminum members from galvanized steel cant joints.

H. Expansion Joint Covers:
1. Install to terminate base flashing 200 mm (8 inches) above roof.
2. Install moisture seals to drain water to outlets that do not permit water to enter buildings construction.
3. Use stainless steel screws when exposed.
4. Three piece assembly:
   a. Install curb section with screws to wood blocking, allowing 6 mm (1/4 inch) at butt joints between sections with splice plate at joint.
   b. Install cant to wood blocking by nailing along horizontal flange every 150 mm (6 inches), with galvanized roofing nails 25 mm (one inch) long.
   c. After completion of base flashing install cap flashing and compression clamp and fasten to the curb or metal cant with stainless steel self-tapping screws with neoprene washers under head spaced approximately 450 mm (18 inches) on center.
   d. Install expansion joint cover with a 6 mm (1/4 inch) wide end joints.

e. Install over end joint a cover plate complete with concealed aluminum flashing, centered under each joint. Fabricate flashing to lap cover not less than four inches.

5. Two piece assembly:
   a. Install curb section with screws allowing 6 mm (1/4 inch) space at end joints with splice plate at joint.
   b. After completion of base flashing bend down cap flashing flange and secure to blocking with screws.
   c. Install expansion joint cover with 6 mm (1/4 inch) wide space at end joints and tension bars at 600 mm (24 inches) on center.
   d. Install cover plates with formed aluminum flashing concealed and centered on joint. Flashing to lap cover not less than 100 mm (4 inches).

3.2 PROTECTION OF ALUMINUM

A. Provide protection for aluminum against galvanic action wherever dissimilar materials are in contact, by painting the contact surfaces of the dissimilar material with two coats of asphalt coating (complete coverage), or by separating the contact surfaces with a preformed neoprene tape having pressure sensitive adhesive coating on side.

B. Paint aluminum in contact with wood, concrete and masonry, or other absorptive materials, that may become repeatedly wet, with two coats of asphalt coating.

3.3 ADJUSTING

Adjust expansion joints to close tightly and be watertight; insuring maximum allowance for building movement.

3.4 PROTECTION

Protect roof accessories from damage during installation and after completion of the work from subsequent construction.

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